

**Naval Health Research Center Detachment (Toxicology)**

**2000 COMMAND HISTORY**

**TOXDET-00-06**

**Kenneth R. Still, Ph.D.  
Captain, MSC, USN  
Officer in Charge**

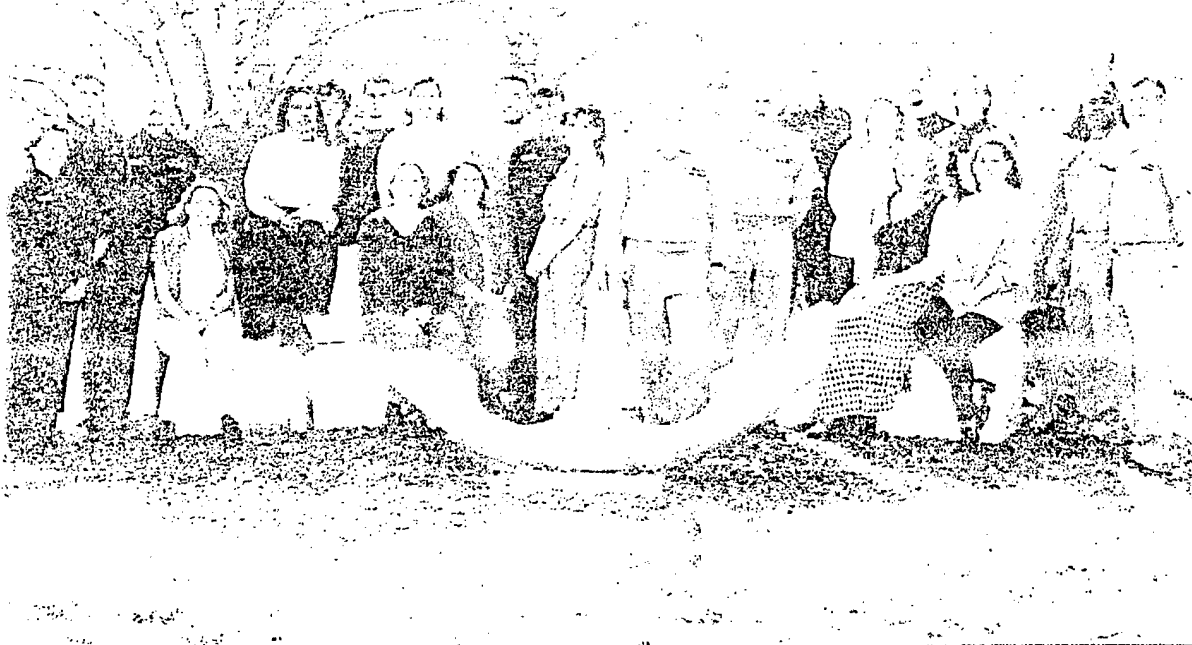
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NAVAL HEALTH RESEARCH CENTER  
DETACHMENT (TOXICOLOGY)  
**2000 COMMAND HISTORY**



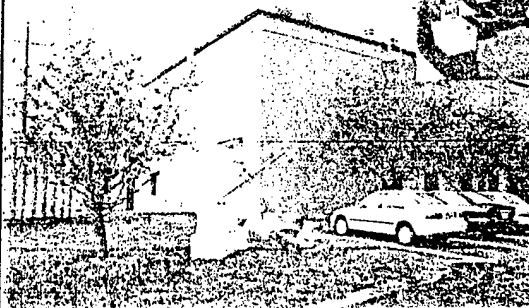
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**ENCLOSURE (1)**



***2000 Command History  
for  
Naval Health Research Center Detachment (Toxicology)  
Wright-Patterson Air Force Base, Ohio***



**Kenneth R. Still, Ph.D.  
Captain, MSC, USN  
Officer in Charge**



October 1999 - September 2000 Command History  
Naval Health Research Center Detachment (Toxicology)  
NHRC TOXDET  
Wright-Patterson Air Force Base, OH

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**2000 Command History  
for  
Naval Health Research Center Detachment (Toxicology)  
Wright-Patterson Air Force Base, Ohio**

**1. BASIC HISTORICAL NARRATIVE:**

**Historical**

On 01 October 1998, this Detachment was realigned under the Naval Health Research Center, San Diego, CA, from the Naval Medical Research Institute, Bethesda, MD.

**Vision**

We shall be an integral asset within the Department of Navy as the center of excellence for toxicology research solving the challenges of today and anticipating those of the future.

**Mission**

We provide the Department of Navy, Bureau of Medicine and Surgery, and other customers with timely solutions to current and anticipated operational problems through an integrated approach to innovative human health effects toxicology research.

**Detachment Goals**

- To gather, interpret, and report research data that characterizes the toxicity of materials that are of interest to the Navy.
- To ensure this data is developed in compliance with good laboratory practices, so as to formulate occupational health hazard evaluations and risk assessment.
- To maintain scientific expertise in providing information used for determining appropriate personnel exposure limits within Navy specific circumstances.

**a. Detachment's Mission:**

The mission of NHRC Detachment (Toxicology), herein referred to as NHRC TOXDET, is to (1) develop the biochemical data necessary to characterize the toxicity of materials of interest to the Navy; (2) use these data to formulate occupational and environmental health-hazard evaluations and risk assessments, including appropriate personnel exposure limits, which address Navy specific circumstances of exposure; and (3) develop and maintain a cadre of naval personnel skilled in the discipline of toxicology and its application to health-hazard evaluation and risk assessment.

**b. Description of Command's Organization:**

Officer in Charge	:	Kenneth R. Still, CAPT, MSC, USN
Executive Assistant	:	Linda L. Kane, LCDR, MSC, USN
Administrative Officer	:	Mrs. Diane V. Hedges
Senior Scientist	:	Robert L. Carpenter, Ph.D., DABT
Leading Chief Petty Officer	:	HMC Edward P. Toohill, USN

NHRC TOXDET research reflects the unit responsiveness to the changing technologies of science while maintaining thrusts in areas that are directly relevant to our most important customer, the fleet sailor.

Immediate Superior in Command:

Commanding Officer, Naval Health Research Center, San Diego, CA

As the Department of Defense realigns organizations and resources, NHRC TOXDET is configured to continue its mission while optimizing the material, personnel, and financial resources under its stewardship. Further, NHRC TOXDET is the Tri-Service Toxicology Center of Excellence in Neurobehavioral and Inhalation Toxicology Research.

# NAVAL HEALTH RESEARCH CENTER DETACHMENT (TOXICOLOGY)

## PHONE DIRECTORY

**Commercial#: (937) 255-6058      Commercial**

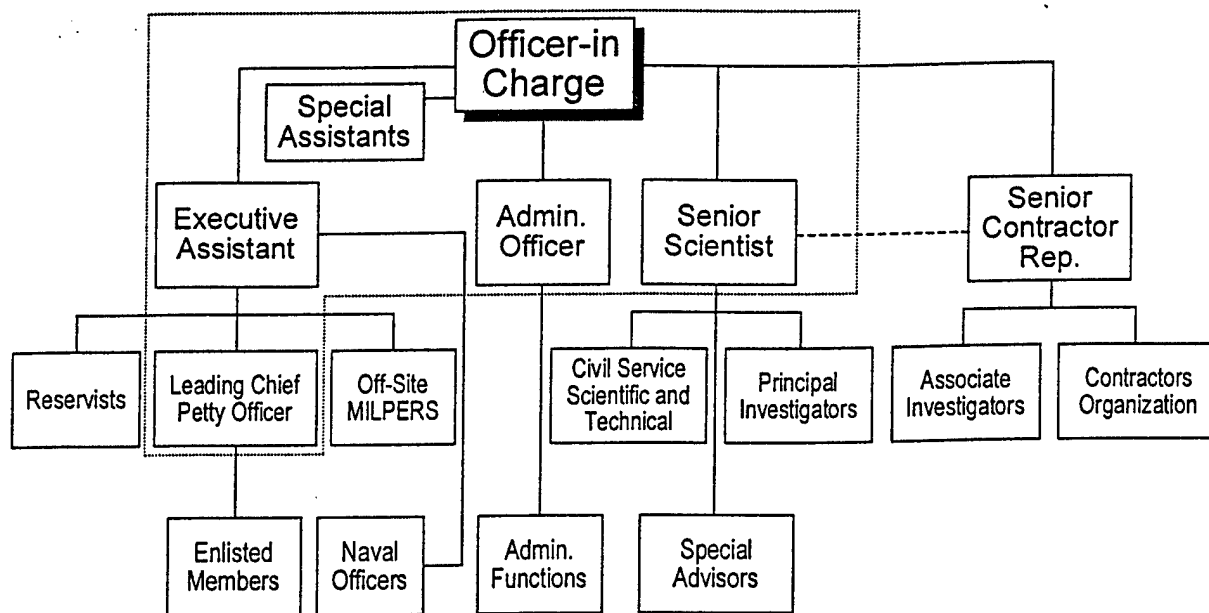
**Fax#: (937) 656-7094**

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**986-7094**

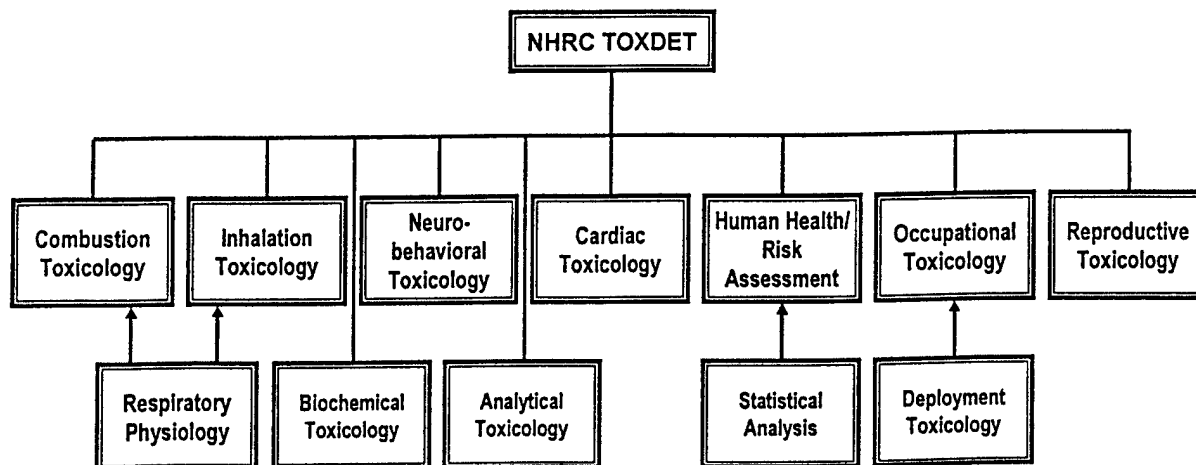
**DSN Fax#:**  
**Base**

**Operator#: (937) 257-1110**

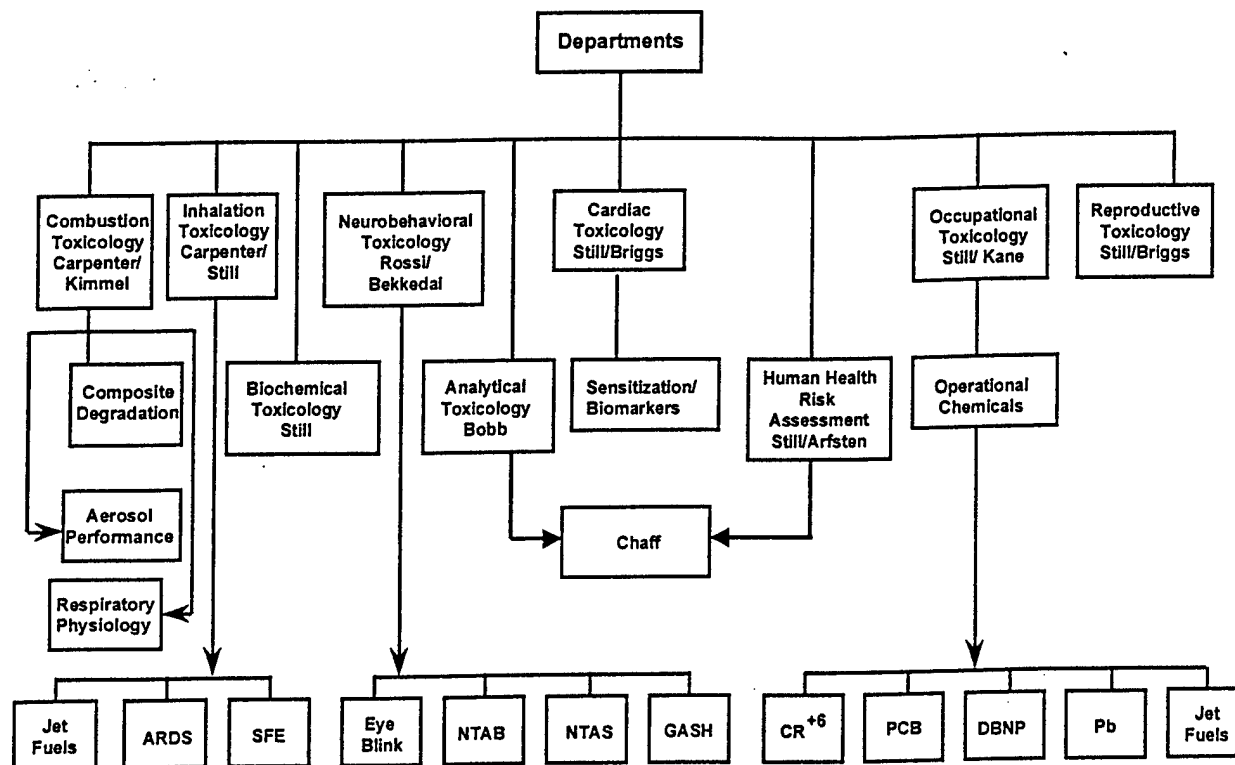
Name	Room#		Ext.	Lab Extension
Still, K. R., CAPT	104B	Officer-in-Charge	202	Cell (937) 657-1162      Pager (800) 680-7106* Pager On Base 169-0703    Off Base 257-0069*
Kane, Linda V. LCDR	104	Executive Assistant	244	
Carpenter, R. L., Dr.	211B	Senior Scientist	212	220/Pager (937) 940-9098*
Hedges, D. V., Mrs.	103	Admin Officer	225	
Arfsten, D. P.	214B		232	
Bekkedal, M.Y.V., Dr.	213A		222	
Bobb, A., LT	214A	CDSO	230	
Briggs, G. B., DVM	110A	Senior Contractor	239	
Carpenter, T., HM1	212A		203	
Clark, C., Ms.	110		207	
Connolly, L. R., Mrs.	122/122A	Librarian	238	
Courson, D. L., Mr.	Bldg 824		255-0608	255-0605
Dean, B., HMC	101	LCPO	210	
Deak, T., Dr.	214C		205	
Dibley, D. L., Mr.	211B	ADP System Administrator	211	
Gatewood, F. M., Mrs.	122B		229	
Gregg, J., Ms.	102		214	
Jung, A. E., Ms.	210B		240	215, 217
Kimmel, E. C., Dr.	Bldg. 824		255-0608	255-0605
Klosowski, A., HM3	212	CHO	243	
Loy, N., Mrs.	210A		247	
Malcomb, W., Mr.	202 & Bld 824		220	
McDougle, Fred	VA			
McInturf, S., Mr.	VA			
Murray, James T., HM2	212		223	
Orcutt, M. A., CAPT	Hospital		257-9129	/6545 Beeper (257-0010) 168-172
Prues, S., Ms.	210C		241	219
Reboulet, J. E., Mr.	Bldg 824		255-0608	255-0605
Reinhart, P., Dr.	Bldg 824		255-6058	255-0605
Stevens, K., HM2	212A		204	
Ritchie, G. D., Dr.	213C		206	
Rossi, J., CDR	213B	HEAD NEURO	234/231	219
Volkart, C., HM2	212A		233	



————— Executive Steering Committee







**c. Mission Accomplishments:**

**1) *Reproductive Toxicology:***

**OUTGOING MEDIA**

On 19-23 March 2000, nine abstracts/posters were presented at the 39<sup>th</sup> Annual Society of Toxicology Meeting held in Philadelphia, PA. Of the nine, three of those were in this category:

1. *Evaluation of Military Fuel Potential to Produce Male Reproductive Toxicity Using the Computer-Assisted Sperm Analysis System*, by G.B. Briggs, W.A. Price, A.F. Walsh, W.K. Alexander, and K.R. Still.
2. *Comparative Study in Laboratory Rats and Rabbits to Validate Sperm Quality Methods and Endpoints*, by W.A. Price, G.B. Briggs, W.K. Alexander, K.R. Still, and K.A. Grasman.
3. *Comparative Study in Laboratory Rats to Validate Sperm Quality Methods and Endpoints*, by W.A. Price, G.B. Briggs, W.K. Alexander, K.R. Still, and K.A. Grasman.

On 26 Mar-3 Apr 2000, nine abstracts/posters were presented at the 40th Navy Occupational Health and Preventive Medicine Workshop held in San Diego CA. Two of the nine in this category were as follows:

1. *Comparative Study in Laboratory Rats to Validate Sperm Quality Methods and Endpoints*, by W.A. Price, G.B. Briggs, W.K. Alexander, K.R. Still, and K.A. Grasman.
2. *Evaluation of Military Fuel Potential to Produce Male Reproductive Toxicity Using the Computer-Assisted Sperm Analysis System*, by G.B. Briggs, W.A. Price, W.K. Alexander, and K.R. Still.

On 10-13 April 2000, five abstracts/posters were presented at the Toxicology and Risk Assessment Approaches for the 21<sup>st</sup> Annual Century Spring Conference held at Kings Island, Cincinnati, OH. Of the five, the one in this category was as follows:

1. *Comparative Study in Laboratory Rats to Validate Sperm Quality Methods and Endpoints*, by W.A. Price, G.B. Briggs, K.R. Still, and W.K. Alexander.

On 8-12 May 2000, six posters were accepted by the Joint Army-Navy-NASA-Air Force (JANNAF) to be presented as papers at the 29<sup>th</sup> Propellant Development & Characterization Subcommittee (PDCS) and the 18<sup>th</sup> Safety & Environmental Protection Subcommittee (S&EPS), NASA in Cocoa Beach, FL. Two of the six papers presented were:

1. *Evaluation of Military Fuel Potential to Produce Male Reproductive Toxicity Using the Computer-Assisted Sperm Analysis System*, by G.B. Briggs, W.A. Price, A.F. Walsh, W.K. Alexander, and K.R. Still.

2. *Comparative Study in Laboratory Rats to Validate Sperm Quality Methods and Endpoints*, by W.A. Price, G.B. Briggs, W.A. Alexander, K.R. Still, and K.A. Grasman.

On May 22 2000, seven abstracts/posters were presented at the American Industrial Hygiene Conference and Exposition held in Orlando, FL. Two of the seven in this category were as follows:

1. *Evaluation of Military Fuel Potential to Produce Male Reproductive Toxicity Using the Computer-Assisted Sperm Analysis System*, by G.B. Briggs, W.A. Price, A.F. Walsh, W.K. Alexander, and K. Still.
2. *Comparative Study in Laboratory Rats and Rabbits to Validate Sperm Quality Methods and Endpoints*, by W.A. Price, G.B. Briggs, W.K. Alexander, and K.R. Still.

On 3-6 December 2000, three abstracts/posters were presented at the Society for Risk Analysis 2000 Annual Meeting held in Arlington, VA on. Of the three, the one in this category was as follows:

1. *Evaluation of Reproductive Toxicity from Exposure to Jet Propulsion Fuel (JP-8) Vapor in Male Rats*, by W.A. Price, G.B. Briggs, K.A. Grasman, and K.R. Still.

## **2) Cardiac Sensitization Toxicology:**

### **OUTGOING MEDIA**

On 19-23 March 2000, nine abstracts/posters were presented at the 39<sup>th</sup> Annual Society of Toxicology Meeting held in Philadelphia, PA. Of the nine, one of those was in this category:

1. *A New Perspective for Identifying Potential Cardiac Sensitizers*, by E. Smith, T. Nakayama, E. Herderick, J. Powers, G. Briggs, K. Still, and R. Hamlin.

On 10-13 April 2000, five abstracts/posters were presented at the Toxicology and Risk Assessment Approaches for the 21<sup>st</sup> Annual Century Spring Conference held at Kings Island, Cincinnati, OH. Of the five, the one in this category was as follows:

1. *A New Perspective for Identifying Potential Cardiac Sensitization*, by G.B. Briggs, T.K. Nakayama, J. Powers, K.R. Still, and E.A. Smith.

On May 22 2000, seven abstracts/posters were presented at the American Industrial Hygiene Conference and Exposition held in Orlando, FL. One of the seven in this category was as follows:

1. *A New Perspective for Identifying Potential Cardiac Sensitizers*, by E. Smith, T. Nakayama, J. Powers, G. Briggs, K. Still, and R. Hamlin.

On 25 August 2000, a manuscript entitled, *A Logistical Regression Model to Predict Onset of Cardiac Arrhythmia*, by E.E. Herderick, J. Powers, T. Nakayama, G.B. Briggs,

K.R. Still, R. Hamlin, and E. Smith was submitted for publication in **Statistics in Medicine**.

On 22 December 2000, a manuscript entitled, *Effect of Altered Autonomic Tone of the Arrhythmic Dose of Ouabain and on Various Physiological Parameters Preceding Ventricular Ectopy*, by T. Nakayama, J. Powers, E.E. Herderick, G.B. Briggs, K.R. Still, E.A. Smith, and R.L. Hamlin was submitted for publication in **Toxicology and Applied Pharmacology**.

### 3) **Risk Assessment:**

#### **OUTGOING MEDIA**

On 7 March 2000, a manuscript entitled, *Application of Statistical Models for Secondary Data Usage of the Navy's Occupational Exposure Database (NOED)*, by J.A. Formisano, Jr., K.R. Still, W.K. Alexander, and M. Lippmann, was submitted for publication in **Applied Occupational and Environmental Hygiene**.

On 26 Mar-3 Apr 2000, nine abstracts/posters were presented at the 40th Navy Occupational Health and Preventive Medicine Workshop held in San Diego CA. Of the nine, three in this category were as follows:

1. *Toxicity of 2,6-Di-tert-Butyl-4-Nitro-Phenol (DBNP)*, by W.K. Alexander, G.B. Briggs, K.R. Still, W. Jederberg, K. MacMahon, W.H. Baker, and C. Mackerer.
2. *Weapons of Mass Destruction Versus Weapons of Opportunity*, by W.K. Alexander, G.B. Briggs, and K.R. Still.
3. *Evaluation of Military Fuel Potential to Produce Male Reproductive Toxicity Using the Computer-Assisted Sperm Analysis System*, by G.B. Briggs, W.A. Price, W.K. Alexander, and K.R. Still (1<sup>st</sup> place in the Research and Development Research Category).

On 10-13 April 2000, five abstracts/posters were presented at the Toxicology and Risk Assessment Approaches for the 21<sup>st</sup> Annual Century Spring Conference held at Kings Island, Cincinnati, OH. Of the five, the one in this category was as follows:

1. *Analyses of U.S. Navy's Occupational Exposure Database (NOED)*, by J.A. Formisano, Jr.

On May 22 2000, seven abstracts/posters were presented at the American Industrial Hygiene Conference and Exposition held in Orlando FL. Three of the seven in this category were as follows:

1. *Validation of Animal-Based and In Vitro-Based Toxicology Assessment Systems*, by G.D. Ritchie, M.Y.V. Bekkedal, and K.R. Still.
2. *Toxicity of 2,6 Di-tert-Butyl-4-Nitro-Phenol (DBNP)*, by W.K. Alexander, K.R. Still, and G.B. Briggs.

3. *Weapons of Opportunity*, by W.K. Alexander, K.R. Still, and G.B. Briggs.

On June 29, 2000 the paper entitled, *Toxicity of 2,6-Di-tert-butyl-4-Nitrophenol (DBNP)*, by W.K. Alexander, G.B. Briggs, K.R. Still, W.W. Jederberg, K. MacMahon, W.H. Baker, and C. Mackerer was submitted to **Applied Occupational and Environmental Hygiene (AOEH)**.

On August 9, 2000, TOXDET was informed by the primary author that submission of the manuscript entitled, *Short Term Dermal Absorption and Penetration of Chemicals from Aqueous Solutions: Theory and Experiment*, by J.N. McDougal and J.L. Jurgens was accepted for publication in **Risk Analysis**.

On September 11, 2000, the editorial office from the **Proceedings of the U.S. Naval Institute** reported that they had accepted the manuscript entitled, *Weapons of Mass Destruction Vs Weapons of Opportunity*, by W.K. Alexander, G.B. Briggs, and K.R. Still for future publication.

On 11-13 October 2000, six abstracts/posters were presented at the Third International Workshop on Submarine Air Monitoring and Air Purification held in Toronto, Ontario, Canada. Of the six, four in this category were as follows:

1. *Toxicity and Risk Assessment of Exposure to 2,6-Di-tert-Butyl-4-Nitro-Phenol (DBNP) in Submarine Atmospheres*, by W.K. Alexander, K.R. Still, by C.L. Wilson, and G.B. Briggs.
2. *Development of Action Levels for Toxic Atmospheric Contaminants in a Disabled Submarine*, by C.L. Wilson, S. Ryder, W. Horn, D. Slavin, R.L. Carpenter, W.K. Alexander, and K.R. Still.
3. *Application of the Global Assessment System for Humans (GASH) to Evaluation of Submarine Atmosphere Exposure Effects*, by J. Rossi III, G.D. Ritchie, A.F. Nordholm, M.Y.V. Bekkedal, and K.R. Still.
4. *Genomic Analysis of Buccal Epithelium and Peripheral Leukocyte Samples from Air Force Jet Fuel Workers: Identification of Biomarkers of Exposure and Implications for Study of Diesel Submarine Crews*, by Wilson, Hanneman, Legare, Dickerson, Frame, Smit, Sonntag, Bekkedal, and Rossi III.

On November 27-December 01 2000, one abstract/poster was presented at the Santa Fe Workshop on Fractals in Biology held in Santa Fe, NM. This presentation was entitled:

1. *Interactions Among Fractal Structures, What Implications for Biological Function?*, by R.L. Carpenter and E.K. Kimmel.

On 1 December 2000, a report was created and cleared entitled, *Derivation of Toxicology and Risk Assessment Values for Ambient Air Toxics Detected at Naval Air Facility, Atsugi, Japan*, by C.L. Wilson, K.R. Still, W.E. Luttrell, G. Winecoff, J. Bowen, our in-house **technical report** number TOXDET 00-05, DTIC Accession # A386482PAA.

On 3-6 December 2000, three abstracts/posters were presented at the Society for Risk Analysis 2000 Annual Meeting held in Arlington, VA. Of the three, the one in this category was as follows:

1. *New Risk Communication and Risk Assessment Strategies to Protect the Health of Deployed U.S. Forces*, by G.B. Briggs, K.R. Still, and C.L. Wilson.

On 21 December 2000, a manuscript entitled, *The Other Edge of the Sword: Chemical Hazards in the Military Environment*, by A.J. Bobb, K.R. Still, R.L. Carpenter, and J. Rossi III was submitted for publication in the **Armed Forces Medical Developments**, Quasar International Communications, London, UK.

In Volume 6, Number 6, 2000, a manuscript entitled, *Risk Assessment in Navy Deployment Toxicology*, by K.R. Still, G.B. Briggs, P. Knechtges, W.K. Alexander, and C.L. Wilson was published in **Human and Ecological Risk Assessment (HERA)**.

#### 4) **Neurobehavioral Toxicology:**

#### OUTGOING MEDIA

On January 26 2000, three posters were presented at the Naval Environmental Health Center's 40<sup>th</sup> Occupational Health and Preventive Medicine Workshop in San Diego, CA. One of the three presented was:

1. *Proteomic Analysis of Renal and Hepatic Protein Expression in Rats Exposed Repeatedly by Jet Fuel Vapor*, by J. Rossi III, G.D. Ritchie, M.Y.V. Bekkedal, C.L. Wilson, and F. Witzmann (1<sup>st</sup> place in the Occupational Health Information Category)

On 8 March 2000 an abstract was submitted to Pharma-Transfer/Ballantyne Ross Publishing. That submission was:

1. *A New Tool for the Rapid Determination of Specific Neuroactive Properties of CNS Drug Candidates and Neurobehavioral Toxicants*, by J. Rossi, III.

On March 16 2000, a paper entitled, *Application of Neurobehavioral Toxicology Methods to the Military Deployment Toxicology Assessment Program*, by J. Rossi III, G. D. Ritchie, A. F. Nordholm, P. L. Knechtges, C. L. Wilson, J. Lin, W. K. Alexander, and K. R. Still was published in **Drug and Chemical Toxicology**; Vol. 23, No 1: 113-138 [2000]. The article outlined the long-term plan of the military Tri-Service Deployment Toxicology Assessment Program (DTAP) to develop the Neurobehavioral Toxicity Evaluation Instrument (NTEI). The NTEI would be a complex database management system that would be used as decision-making support for military personnel in deployment situations.

On 24 March 2000, a manuscript entitled, *Reduction of Motor Seizures in Rats Induced by the Ethyl Bicyclopophosphate Trimethylolpropane Phosphate*, by J. Rossi III, G.D. Ritchie, and A.F. Nordholm was submitted for publication to **Progress in Neuro-Psychopharmacology and Biological Psychiatry**.

On 19-23 March 2000, the following abstracts were presented at the 39th Annual Society of Toxicology Meeting held in Philadelphia, PA. Of the nine submitted, one was in this category:

1. *Fluorocarbons CFC-12 (Dichlorodifluoromethane) and HFC-134A (1,1,1,2-Tetrafluoroethane) Induce Depolarization of Brainstem and Hippocampal Neurons*, by J. Lin, J.B. Dean, G.D. Ritchie, A.F. Nordholm, and J. Rossi III.

On 26 Mar-3 Apr 2000, nine abstracts/posters were presented at the 40th Navy Occupational Health and Preventive Medicine Workshop held in San Diego CA. Of the nine, the one in this category was as follows:

1. *Effects of Repeated Exposure to JP-8 Vapor on the Cognitive Capacity of Rats*, by J. Rossi III, G.D. Ritchie, W. Malcomb, R.L. Carpenter, M.Y.V. Bekkedal, and G. Wenger.

On 10-13 April 2000, five abstracts/posters were presented at the Toxicology and Risk Assessment Approaches for the 21<sup>st</sup> Annual Century Spring Conference held at Kings Island, Cincinnati, OH. Of the five, the one in this category was as follows:

1. *Neurobehavioral Toxicology Endpoints for the 21st Century*, by G.D. Ritchie, M.Y.V. Bekkedal, A.F. Nordholm, and J. Rossi III.

On 8-12 May 2000, six posters were presented at the Joint Army-Navy-NASA-Air Force (JANNAF) 29<sup>th</sup> Propellant Development & Characterization Subcommittee (PDCS) and the 18<sup>th</sup> Safety & Environmental Protection Subcommittee (S&EPS), NASA in Cocoa Beach, FL. One of the papers presented was:

1. *Effects of Repeated Exposure to JP-8 on Simple and Complex Learning Tasks in Rats*, by G.D. Ritchie, K.R. Still, D.W. Wright, G.A. Wenger, W. Malcomb, R.L. Carpenter, A.F. Nordholm, and J. Rossi III.

On 9 May 2000, the paper entitled, *Trimethylolpropane Phosphate (TMPP) Induces Epileptiform Discharges in the CA1 Region of the Rat Hippocampus*, by J. Lin, G.D. Ritchie, J. Rossi III, J.J. Pancrazio, D.A. Stenger, and A.F. Nordholm was submitted to **Toxicology and Applied Pharmacology**. Per the publisher, changes were made and on 11 October 2000, *Trimethylolpropane Phosphate Induces Epileptiform Discharges in the CA1 Region of the Rat Hippocampus*, by J. Lin, G. D. Ritchie, D. A. Stenger, A. F. Nordholm, J. J. Pancrazio, and J. Rossi, III, was re-submitted to **Toxicology and Applied Pharmacology**, which was published in Vol. 171, No. 2, Mar 2001, pp. 126-134 (doi:10.1006/taap.2000.9120)

On May 19-26, 2000, seven abstracts/posters were presented at the American Industrial Hygiene Conference and Exposition held in Orlando, FL. Of the seven, the one in this category was as follows:

1. *Validation of Animal-Based and In Vitro-Based Toxicology Assessment Systems*, by G.D. Ritchie, M.Y.V. Bekkedal, and K.R. Still.

On 1 June 2000, a manuscript entitled, *Acute Neurobehavioral Effects in Rats from Exposure to HFC-13a or CFC-12*, by G.D. Ritchie, E.C. Kimmel, L.E. Bowen, J.E. Reboulet, and J. Rossi III was submitted for publication in **NeuroToxicology**.

On 10-13 April 2000, five abstracts/posters were presented at the Toxicology and Risk Assessment Approaches for the 21<sup>st</sup> Annual Century Spring Conference held at Kings Island, Cincinnati, OH. Of the five, one submitted as a manuscript in **The Science of the Total Environment** was as follows:

1. *Behavioral Sensitization Following Exposure to Low Doses of a Chemical of Military Interest*, by M.Y.V. Bekkedal, G.D. Ritchie, and J. Rossi III.

On 24-29 June 2000, two abstracts/posters were presented at the Behavioral Toxicology Society (BTS) Annual Meeting held in Palm Beach, FL. Those two were as follows:

1. *Conditioned Eyeblink Response (CER) Learning in Personnel Exposed Occupationally to Jet Fuel*, by G.D. Ritchie, W.K. Anger, A.F. Nordholm, M.Y.V. Bekkedal, and J. Rossi III.
2. *Modulation of the Convulsive Effects of TMPP in Fischer-344 Rats*, by J. Rossi III, G.D. Ritchie, S. McInturf, and A.F. Nordholm.

On 26 June 2000, an in-house technical report was created and cleared entitled, *A Neurodevelopmental Study of Oral Ammonium Perchlorate Exposure on the Motor Activity of Pre-Weanling Rat Pups*, by M.Y.V. Bekkedal, T. Carpenter, J. Smith, C. Ademujohn, D. Maken, and D.R. Mattie.

On August 14-17 2000, one abstract/poster was presented at the Annual World Congress: Drug Discovery Technology 2000 held in Boston, MA. That submission was:

1. *A New Tool for the Rapid Determination of Specific Neuroactive Properties of CNS Drug Candidates and Neurobehavioral Candidates*, by J. Rossi III, T. Deak, S. McInturf, G.D. Ritchie, and M.Y.V. Bekkedal.

On 15 September 2000, the publication entitled, *A Review of the Neurotoxicity Risk of Selected Hydrocarbon Fuels*, by G.D. Ritchie, K.R. Still, W.K. Alexander, A.F. Nordholm, C.L. Wilson, J. Rossi III, and D.R. Mattie, was accepted for publication in **The Journal of Toxicology and Environmental Health, Part B**.

On 11-13 October 2000, six abstracts/posters were presented at the Third International Workshop on Submarine Air Monitoring and Air Purification that was held in Toronto, Ontario, Canada. Of the six, two in this category were as follows:

1. *Application of The Global Assessment System for Humans (GASH) to Evaluation of Submarine Atmosphere Exposure Effects*, by J. Rossi III, G.D. Ritchie, A.F. Nordholm, M.Y.V. Bekkedal, and K.R. Still.



2. *A Neurodevelopmental Study of Oral Ammonium Perchlorate Exposure on the Motor Activity of Pre-Weanling Rat Pups*, by M.Y.V. Bekkedal, T.M. Carpenter, J. Smith, C. Ademujohn, D. Maken, and D.R. Mattie.

On October 15 2000, the following paper was published under Navy Technical Report Number TOXDET-00-03; *Neurodevelopmental Study of the Effects of Oral Ammonium Perchlorate Exposure on the Motor Activity of Pre-Weanling Rat Pups*, by M.Y.V. Bekkedal, T.M. Carpenter, J. Smith, C. Ademujohn, D. Maken, and D.R. Mattie, (2000).

On 4-9 November 2000, five abstracts/posters were presented at the Annual Society for Neuroscience Conference held in New Orleans, LA. Of the five, four in this category were as follows:

1. *Neurobehavioral Assessment Battery Differentiates Recovery from Bacterial Recovery from Bacterial Meningitis*, by J. Irazuta, M.Y.V. Bekkedal, J. Miller, J. Rossi III, G.D. Ritchie, and G. deCourten-Myers.
2. *Does a Molecule in the CSF of Exercised Rats Code Physical Fatigue?*, by J. Rossi III, C.L. Wilson, G.D. Ritchie, M.Y.V. Bekkedal, and A.F. Nordholm.
3. *Long-Term Effects of Repeated Exposure to JP-8 Jet Fuel Vapor on Higher Cognitive Capacity in Rats*, by G.D. Ritchie, G.A. Wenger, M.Y.V. Bekkedal, R.L. Carpenter, D.W. Wright, A.F. Nordholm, and J. Rossi III.
4. *Development of Tissue-Based Biosensors for Neurotoxicity Risk Assessment*, by J. Rossi III, D.A. Stenger, J.J. Pancrazio, J.D. Andreadis, J. Lin, G.D. Ritchie, G. Gross, A.F. Nordholm, and K.R. Still.

On 6 November 2000, a manuscript entitled, *Serum Cleaved Tau Protein and Neurobehavioral Battery of Tests as Markers of Brain Injury in Experimental Bacterial Meningitis*, by J.E. Irazutza, G. de Courten-Myers, F.P. Zemian, M.Y.V. Bekkedal, and J. Rossi III was submitted for publication in **Brain Research**.

On 3-6 December 2000, three abstracts/posters were presented at the Society for Risk Analysis 2000 Annual Meeting held in Arlington, VA. Of the three, the one in this category was as follows:

1. *Neurobehavioral Risk Assessment Extrapolations from Electrophysiological Probes of Brain Tissue Slices*, by J. Rossi III, S. McInturf, J. Lin, and M.Y.V. Bekkedal.

#### 5) **Inhalation Toxicology:**

#### **OUTGOING MEDIA**

On 10 March 2000, a report was created and cleared, entitled *Acute Respiratory Toxicity of Advanced Composite Material (ACM) Combustion Atmospheres: B2-ACM*, by E.C. Kimmel, D.L. Courson, J.E. Reboulet, G.S. Whitehead, K.A. Rice, W.K. Alexander,

K.A. Phillips, R.L. Carpenter, and K.R. Still, our in-house technical report number TOXDET 00-01, DTIC Accession # A374860PAA.

On 19-23 March 2000, nine abstracts/posters were presented at the 39<sup>th</sup> Annual Society of Toxicology Meeting held in Philadelphia, PA. Of the nine, the one in this category was as follows:

1. *Effects of Expired Carbon Dioxide on Ventilation and Aerosol Deposition in Guinea Pigs Undergoing Barometric Plethysmography*, by E.C. Kimmel, G.S. Whitehead, and R.L. Carpenter.

On 8-12 May 2000, six posters were presented at the Joint Army-Navy-NASA-Air Force (JANNAF) 29<sup>th</sup> Propellant Development & Characterization Subcommittee (PDCS) and the 18<sup>th</sup> Safety & Environmental Protection Subcommittee (S&EPS) Joint meeting in Cocoa Beach, FL. Two of the six presented were:

1. *Fibers/Particulate Matter from the Partial Pyrolyzation of Advanced Composite Materials*, by D.L. Courson, J.C. Lipscomb, W.K. Alexander, K.R. Still, and E.C. Kimmel.
2. *Inhalation and Pulmonary Toxicity of Advanced Composite Material Combustion Atmospheres*, by E.C. Kimmel, D.L. Courson, J.E. Reboulet, G.S. Whitehead, P. Reinhart, K. Rice, W.K. Alexander, K.R. Still, K. Phillips, and R.L. Carpenter.

On May 19-26, 2000, seven abstracts/posters were presented at the American Industrial Hygiene Conference and Exposition held in Orlando, FL. Of the seven, the one in this category was as follows:

1. *Characterization of Aerosols Generated Through Pyrolysis of Advanced Composite Materials*, by D.L. Courson, W.K. Alexander, K.R. Still, and E.C. Kimmel.

In July of 2000, Dr. E.C. Kimmel, Geo-Centers, was invited to present a paper entitled *Acute Respiratory Toxicity of Smoke Generated by Pyrolysis of Carbon-Graphite/Epoxy Composite Material*, at the International Aviation Fire Protection Agency held in Manchester, United Kingdom, November 7-9, 2000.

On 10 August 2000, a manuscript entitled *The Acute Respiratory Toxicity of Smoke Generated by Pyrolysis of Carbon-Graphite/Epoxy Advanced Composite Material*, by E.C. Kimmel, D.L. Courson, J.E. Reboulet, G.S. Whitehead, W.W. Brinkley, K.R. Still, and R.L. Carpenter, was submitted for publication in **Journal of Fire Sciences**.

On 14 August 2000, a report was created and cleared entitled *Airway Reactivity Response to Advanced Composite Material (ACM)*, by E.C. Kimmel, J.E. Reboulet, D.L. Courson, G.S. Whitehead, K.R. Still, W.K. Alexander, R.L. Carpenter, and K.A. Phillips, our in-house technical report number TOXDET 00-02, DTIC Accession # A380781PAA.

On 23 August 2000, a manuscript entitled *A Small Animal Plethysmograph/Exposure Tube for Determination of Respiratory Mechanics during Exposure using a Non-Invasive*

*Method to Measure Intrapleural Pressure*, by E.C. Kimmel, was submitted for publication to **Toxicological Methods**.

In the 2000 journal the **American Industrial Hygiene Journal**, the following paper entitled as follows was published: *Airborne Aldehydes from Heating Rosin Core Solder and Liquid Rosin Flux to Soldering Temperatures*, by P.A. Smith, C.R. Bowerbank, M.L. Lee, M. Solberg, D.B. Drown, W.K. Alexander, and K.R. Still, **AIHAJ** 61:95-101 (2000).

#### 6) **Chaff Countermeasure Toxicity:**

##### **OUTGOING MEDIA**

On 19-23 March 2000, nine abstracts/posters were presented at the 39<sup>th</sup> Annual Society of Toxicology Meeting held in Philadelphia, PA. Of the nine, the one in this category was as follows:

1. *Estimation of Aluminum Bioavailability from Degradable Chaff Countermeasures Using a Physiologically-Based Extraction Test*, by C.L. Wilson, H. Zhang, K. Lehman, T. Carpenter, and W. Alexander.

On 26 Mar-3 Apr 2000, nine abstracts/posters were presented at the 40th Navy Occupational Health and Preventive Medicine Workshop held in San Diego CA. Of the nine, the one in this category was as follows:

1. *Potential Toxicity of Chaff Counter Measures: Contribution of Aluminum Dissolution*, by K. Lehman, T. Carpenter, K. Rice, A. Miladi, A. Klosowski, C.L. Wilson, H.M. Zhang, and W.K. Alexander, and K.R. Still.

On 8 May 2000, a report was created and cleared, entitled *The Inhalation Toxicity of Glass Fibers - A Review of the Scientific Literature*, by R.L. Carpenter and C.L. Wilson, our in-house technical report number TOXDET 99-07, DTIC AD # A386508PAA.

In November 2000, a report was created and cleared, entitled *Estimation of Aluminum Contributions of U.S. Navy Flight Training Operations in the Chesapeake Bay*, by C.L. Wilson, A. Miladi, R.L. Carpenter, W.K. Alexander, and K.R. Still, our in-house technical report number TOXDET 00-04, DTIC # A386454PAA.

On 3 December 1999, a manuscript entitled *Estimation of Aluminum Contributions of U.S. Navy Flight Training Operations in the Chesapeake Bay*, by C.L. Wilson, A. Miladi, R.L. Carpenter, W.K. Alexander, and K.R. Still was submitted for publication to the **American Chemical Society's Environmental Science and Technology**, and resubmitted on 27 September 2000 to **Environmental Toxicology and Chemistry**.

#### 7) **Administration:**

##### **OUTGOING MEDIA**

On March 16 2000, a paper entitled *Rapid Separation of Nitroaromatic Compounds by Solvating Gas Chromatography*, by P.A. Smith, C.R. Bowerbank, M.L. Lee, K. Williams,

W. Alexander, and K.R. Still was published in **Drug and Chemical Toxicology**; Vol. 23, No 1: 155-160; 2000.

On 26 Mar-3 Apr 2000, nine abstracts/posters were presented at the 40th Navy Occupational Health and Preventive Medicine Workshop held in San Diego, CA. Of the nine, two in this category were as follows:

1. *The Role of Hazardous Material and Control Program Managers in Toxicology Research Laboratories*, by E. Toohill, A. Klosowski, K. Lehman, K.R. Still, and W.K. Alexander.
2. *The Role of the Navy Hospital Corpsmen Performing as Research Technicians on Vaporized Military Aviation Fuels Projects*, by E. Toohill, T. Carpenter, K. Rice, A. Miladi, A. Klosowski, K. Lehman, K.R. Still, W.K. Alexander, C.L. Wilson, and R.L. Carpenter (1<sup>st</sup> place in Research and Development Information Category).

On 28 August 2000, a manuscript entitled *Stress-Induced Sickness Behaviors: An Alternative Hypothesis for Responding During Maternal Separation*, by M.B. Hennessy, T. Deak, and P.A. Schiml-Webb, was submitted for publication to **Developmental Psychobiology**.

#### 8) **Jet Fuels:**

### OUTGOING MEDIA

On 26 Mar-3 Apr 2000, nine abstracts/posters were presented at the 40th Navy Occupational Health and Preventive Medicine Workshop held in San Diego, CA. Of the nine, the two in this category were as follows:

1. *The Role of the Navy Hospital Corpsmen Performing as Research Technicians of Vaporized Military Aviation Fuels Projects*, by E. Toohill, T. Carpenter, K. Rice, A. Miladi, A. Klosowski, K.R. Still, W.K. Alexander, C.L. Wilson, and R.L. Carpenter.
2. *Proteomic Analysis of Renal and Hepatic Protein Expression in Rats Exposed Repeatedly by Jet Fuel Vapor*, by J. Rossi III, G.D. Ritchie, M.Y.V. Bekkedal, C.L. Wilson, and F. Witzmann.

On 8-12 May, 2000, six abstracts/posters were presented at the Joint Army-Navy-NASA-Air Force (JANNAF) 29<sup>th</sup> Propellant Development & Characterization Subcommittee (PDCS) and the 18<sup>th</sup> Safety & Environmental Protection Subcommittee (S&EPS) Joint meeting in Cocoa Beach, FL. Of the six abstracts submitted, the following three were in this category:

1. *Effects of JP-8 Jet Fuel on Homeostasis of Clone 9 Rat Liver Cells*, by C.L. Wilson, R. Barhoumi, and R. Burghardt.
2. *Evaluation of Military Fuel Potential to Produce Male Reproductive Toxicity Using the Computer-Assisted Sperm Analysis System*, by G.B. Briggs, W.A. Price, A.F. Walsh, W.K. Alexander, and K.R. Still.

3. *Effects of Repeated Exposure to JP-8 on Simple and Complex Learning Tasks in Rats*, by G.D. Ritchie, K.R. Still, D.W. Wright, G.A. Wenger, W. Malcomb, R.L. Carpenter, A.F. Nordholm, and J. Rossi III.

On 19-23 May 2000, nine abstracts/posters were presented at the 39<sup>th</sup> Annual Society of Toxicology Meeting held in Philadelphia, PA. Of the nine, the two in this category were as follows:

1. *Proteomic Analysis of Renal and Hepatic Protein Expression in Rats Exposed Repeatedly to Jet Fuel Vapor*, by F. Witzmann, G.D. Ritchie, R.L. Carpenter, A.F. Nordholm, C.L. Wilson, and J. Rossi III.

2. *Investigation of the Effects of Repeated Exposure to JP-8 Vapor on the Cognitive Capacity of Rats*, by J. Rossi III, D. Wright, G.D. Ritchie, W. Malcomb, R.L. Carpenter, M.Y.V. Bekkedal, A.F. Nordholm, and G. Wenger.

On 13 September 2000, a manuscript entitled, *Effects of Repeated Exposure of Rats to JP-5 or JP-8 Jet Fuel Vapor on Neurobehavioral Capacity and Neurotransmitter Levels*, J. Rossi III, A.F. Nordholm, R.L. Carpenter, G.D. Ritchie, and W. Malcomb was submitted for publication to the **Journal of Toxicology and Environmental Health**.

On 4-9 November 2000, five abstracts/posters were presented at the Annual Society for Neuroscience Conference held in New Orleans LA. Of the five, the one in this category was as follows:

1. *Use of CER to Evaluate Personnel Exposed Chronically to Jet Fuel*, by S. McInturf, A.F. Nordholm, M.Y.V. Bekkedal, G.D. Ritchie, K. Lehman, and J. Rossi III.

## **FACILITIES AND EQUIPMENT**

During the reporting year of 2000, the Air Force secured the funding for the new Tri-Service Toxicology Laboratory. NHRC/TD was an integral part of the laboratory planning.

1. On 20 December 2000, there was a Military Construction (MILCON) Meeting in Building 79 of WPAFB.

2. The initial meeting for design of the \$15 M Tri-Service Toxicology Laboratories Building was held with the Contracting Architect firm A.M. Kinney. NHRC/TD was represented by LT Andrew J. Bobb, MSC USNR, and HMC Edward Toohill. The purpose of the meeting was to begin the process of defining the users' needs for the building, to be developed into a preliminary plan and RFP for a design/build contractor. The process of design was described and the general nature of needs from both the Air Force and Navy organizations was discussed. Meetings would continue in January.

## **FUNDING**

On January 5, 2000, TOXDET submitted a collaborative research proposal with MIT to SERDP.

On February 16, 2000, the following 19 pre-proposals were submitted to ONR:

1. Mechanisms and Pathogenesis of Acute Lung Injury Related to Inhalation of Combustion Atmospheres
2. Development of a Real-Time Aerosol Analyzer for Exposure Assessment
3. Improvements in the Cardiac Toxicology Animal Model to Prevent Ventricular Arrhythmia in Warfighters Exposed to Halons
4. Inhalation Exposure Assessment for 2,6-Di-tert-butyl-4-nitrophenol (DBNP), A Contaminant in Submarine Atmospheres
5. Development of a Hazardous Vapor Detection System for Exposure Assessment
6. Development of a Model to Predict Heavy Metal Exposures During Paint Removal Operations
7. Growth Factor-Induced Fatigue: Further Neurobehavioral Characterization of a Fatigue-Associated Protein
8. Oxidative Stress Reactions to Metal Exposures in Shipboard Air
9. Induction of Metallothionein by Uranium Oxide in Post Combat Environments
10. Evaluation of Reproductive Toxicity from Exposure to Jet Fuel (JP-8) Vapor in Rats
11. Models of Non-Cancer Toxic Effects: Liver Necrosis and Cell Survival
12. Exposure Assessment and Toxicity of Man-Made Vitreous Fibers
13. Development of Health Risk Assessment Tools for Aerosol Inhalation Hazards: Aerosol Clearance
14. Risk Factors Modifying Sarin Pharmacokinetics: Interaction of Sarin, Pyridostigmine, and Exercise
15. The Use of Human Embryonic Stem Cell Tissue Culture as an In Vitro Model for a Neurological Screening Assay of Lead Toxicity
16. Comparative Study in Laboratory Rats to Validate Sperm Quality Methods and Endpoints
17. Investigation of the Hepato-and Nephrotoxicity of 2,6-di-t-Butyl-4-Nitrophenol (DBNP), Butanoic Acid and Difluorodimethylsilane
18. Modulation of Phase I Drug Metabolizing Enzyme Activity by JP-8 Jet Fuel Exposure
19. Cellular and Molecular Neurotoxicity Screening of JP-8 Jet fuel

On June 24, 2000, funding was secured from the Defense Advanced Research Projects Agency (DARPA) as part of the Tissue-Based Biosensor (TBB) program. The contribution from the Neurobehavioral Effects Laboratory is to use micro-electrode arrays to measure physiological changes at the neural level during exposures to chemicals, including those that present a biological threat to deployed military personnel. In addition, a library of response patterns to a class of chemical exposures will be developed to be used for identifying unknown exposure compounds.

#### **CRADAs and FUNDING**

On January 5, 2000, Discussions for setting up a CRADA with MIT had begun.

On January 26, 2000, the CRADA with OSU was finalized.

On February 16, 2000, the CRADA was delivered to Ohio State University for their legal review and signature.

#### **PERSONNEL**

On Jul 23, 2000, LT Andrew J. Bobb reported to the TOXDET on 16 Aug 00 from Officer Indoctrination School, Naval Education and Training Center, Newport, RI.

On December 31, 2000, LCDR Linda V. Kane, MSC reported aboard from San Diego, CA. LCDR Kane is the new TOXDET XA.

**9) Research program descriptions:**

**WORK UNITS**

New:

DN234936 NRL Reimbursable-10001 Consultation on Genomics Experiments	Start: 1-5-00
DN235002 AF Reimbursable-10004 Ammonium Perchlorate Studies	Start: 1-26-00
DN235003 DARPA Reimbursable-10005 DARPA Tissue Based Biosensor (TBB) Technologies	Start: 2-26-00
DN235005 AFOSR Reimbursable (RLC)-10007 Measure Concentration of JP-8 Fog Created by Cold Weather Engine Starts	Start: 3-13-00
DN235000-61153N MR4203-10002 "Fatigue Protein" at Elevated Levels after Extreme Physical Exercise	Start: 1-10-00
DN235001-61153N MR4112-10003 61153N MR4203-10003 Global Assessment Test for Humans (GASH)	Start: 1-15-00
DN235004-63706N-M00096.004-10006 Development of a Tissue Based Sensor System	Start: 3-11-00

Continuations:

DN234933-DARPA Reimbursable(Grant)-1907 University of Southern California	Start: 6-29-99
DN234931-61152N.00004.001-1905 Modulation of Phase I Drug Metabolizing Enzyme Activity by JP-8 Jet Fuel Exposure	Start: 1-20-99
DN244555-63706.M00096.004-1516 NTAS: Methods for Assessment of Toxicants/Stressors	Start: 10-1-94
DN241218 63706.M00096.004-1605 Relevance of Known Behavioral, Neurophysiological, and Metabolic Processes for Interpreting and Predicting the Neurobehavioral Toxicity of Specific Substances of Important to Military Tri-Service	Start: 10-1-95
DN234932-61152N-MR0004-1906 Cellular and Reproductive Toxicity of 2,6-Di- tert-butyl-4-nitrophenol (DBNP)	Start: 10-01-00



DN240570 63706N M00096-1713

Develop, Test, and Validate a Model for Estimating Human Neurobehavioral Risk for Exposure to Chemical Compounds Start: 10-1-96

DN240571 63706N. M00096-004-1714

Research of Fire, Gas, and Smoke Induced Adult Respiratory Distress Syndrome (ARDS) Start: 10-1-96

DN234935-63721N.W2210 NAWCAD Reimbursable-1822  
CHAFF

Start: 6-22-99

DN244519-NEHC Reimbursable-1323

Risk Assessment - Develop Toxicity Values Start: 10-1-92

## **2. SPECIAL TOPICS:**

### **VISITS**

On March 16, 2000, RADM Hugh Scott, MC, USN (Ret), Vice-President Life Sciences, Geo Centers, visited the TOXDET to discuss laboratory capabilities and research expansion.

## ACCOMPLISHMENTS

CAPT Still presented the following awards at an Awards Ceremony on 4 Feb 00:

HM2 Rice	Outstanding PRT Award
HM2 Rice	Certificate of Graduation PMI Course
HM3 Lehman	Navy Pistol Ribbon (Expert)
HM3 Lehman	Navy Rifle Medal (Expert)
HM3 Klosowski	Navy Rifle Medal
HM1 Carpenter	Navy Rifle Medal
HMC Toohill	Navy Pistol Ribbon (Sharpshooter)
HMC Toohill	Navy Rifle (Marksman)
Ms. Gregg	Letter of Appreciation

HM3 Lehman attended GASH/BARS training sponsored by USAFIERA at the Oregon Health Sciences Research Center in Portland Oregon, 7 - 11 February 2000.

During the week of February 9, 2000, Mrs. Diane Hedges attended *Military Personnel Management Course (MPMC)* at WPAFB, Feb 8th & 9th.

On February 16, 2000, Petty Officer Miladi was accepted to Medical School at the Medical College of Ohio and to the Wright State University School of Medicine.

On February 23, 2000, Dr. Bekkedal was appointed full member of the USAF IACUC at Wright-Patterson AFB, OH.

During the week of February 23, 2000, all TOXDET staff completed mandatory USAF Computer Information Assurance Training.

During the week of March 9 2000, Wright-Patterson AFB conducted the Annual Safety Inspection at the TOXDET. No discrepancies were noted and an Excellent Rating was received.

During the week of March 9, 2000, the TOXDET conducted command fire drill and emergency response, which was coordinated with the Base Fire Department.

On May 15 2000, Mr. Anis Miladi was commissioned as an Ensign, Medical Corps, U.S. Naval Reserve.

On December 31, 2000, Mr. William Price (Geo-Centers) received the Society of Toxicology (SOT) Student Travel Award for his research work on jet fuel influences on reproductive endpoints in rats.

HM1 Carpenter was the TOXDET's 2000 Sailor of the Year candidate, met with the NHRC 1999 SOY Board in 15 January 2000 at NAMRL, and was subsequently selected as NHRC SOY on that date.

## SEASONAL

The TOXDET hosted its annual Holiday Dinner Wednesday, 23 November 2000, for all TOXDET personnel and their families.

The holiday routine was in effect from mid-December 1999 through 04 January 2000.

## **NOTABLES**

On January 5, 2000, CDR Alexander, HMC Toohill, and Dr Briggs traveled to Ohio State University on 13 Jan 00 to discuss ongoing projects in cardiotoxicology.

On January 13, 2000, CAPT Still attended an EPA, TSCA, ITC meeting as the DOD Representative in Washington D.C.

In January 2000, Dr. Carpenter attended an AFOSR Workshop on the toxicology of jet fuels and presented a briefing on upcoming AF/Navy efforts to sample the jet fuel aerosol from cold engine starts.

January 15 2000, the Neurobehavioral Effects Laboratory (NEL) at the Naval Health Research Center Detachment (Toxicology) joined with a team of researchers led by Brooks Air Force personnel to study the acute and chronic effects of exposure to jet fuel vapors. The entire team travels to several different Air Force bases collecting data for a variety of physiological parameters on airmen responsible for aircraft fuel tank cleaning and maintenance. The specific contribution of the NEL is detecting what may be subtle changes in brain function and neural integrity using the conditioned eyeblink response test. These data, along with that from several other measures, is expected to help identify any possible adverse effects of acute and chronic JP-8 exposure.

CAPT Still attended the AIHA Task Force on Low Dose Exposure in Amhearst MA from 18-21 January 2000.

CDR Rossi conducted a DARPA site visit at the University of North Texas, 24-25 January 2000.

In late January 2000, CAPT Still met with the incoming Chair of the WPAFB USAF IACUC, LTCOL Brinkley, USA, to discuss animal use procedures for future studies.

CAPT Kenneth R. Still, CDR William K. Alexander, CDR John Rossi III and HM3 Keith Lehman all attended the Naval Environmental Health Center's 40<sup>th</sup> Occupational Health and Preventive Medicine Workshop in Norfolk, VA from 28 January to 01 February 2000.

CDR Rossi attended various meetings at DARPA, NRL, ONR while in Washington DC, 30 January - 9 February 2000.

CDR Rossi traveled to Pittsburgh on 7 February 2000 for a site visit at Cellomics and to Washington DC on 7 February 2000 to attend a DARPA PI meeting.

CAPT Still attended a meeting at USUHS on 8 February 2000.

Capt Still attended an EPA-TSCA-ITC meeting on 10 February 2000.

CDR Alexander, Dr. Carpenter and Dr. Briggs visited Ohio State University to discuss Cardiac Sensitization Studies on 28 February 2000.

On February 29 2000, CAPT Still attended the 88<sup>th</sup> Wing Base Commanders Conference on Environmental Issues at Wright-Patterson AFB, OH.

CDR Rossi attended meetings at the University North Texas and a Meeting on JP-8 Data at Dyess AFB, Texas, 25 February - 04 March 2000.

In early March 2000, TOXDET collaborated with Old Dominion University on protocol development to derive Cancer Slope Factors (CSF) for atmospheric chemicals of Navy concern at Atsugi, Japan.

In March 2000, CDR Alexander taught a two-day course at USUHS regarding aerosol characterization theory and management.

On March 16, 2000, the following briefing information was submitted in response to the TARA Input request from ONR:

1. Estimation of Environmental Hazards from Dispersed Chaff Countermeasures
2. A New Perspective for Identifying Potential Cardiac Sensitizers in Military Operations
3. Evaluation of Chemicals of Navy Interest for Reproductive Toxicity
4. Acute Inhalation/Lung Injury: Mechanisms, Pathogenesis, and Risk
5. Respiratory Toxicity of Advanced Composite Material (ACM) Combustion Atmospheres
6. Overview of Research Areas Neurobehavioral Effects Laboratory (NEL)
7. Neurobehavioral Effects Laboratory (NEL)

The TOXDET sponsored and participated in the Virginia Stevens Elementary School Annual Adopt-A-School graduation on Friday, 17 March 2000.

In June 2000, the Neurobehavioral Effects Laboratory (NEL) at the Naval Health Research Center Detachment (Toxicology) completed a study in the neurodevelopmental toxicology of ammonium perchlorate. This salt is known to cause hypothyroidism, and the research was designed to determine the effects of low levels of thyroid hormones on developing rat pups. The dams were exposed to different doses of the salt through their drinking water, so the pups were exposed *in utero* and during the neonatal period. At 3 different pre-weaning ages the pups were tested in a measure of general locomotor activity to investigate integrity of the neural systems underlying gross motor movements. The data from this research will be used to assist the Environmental Protection Agency (EPA) in developing guidelines for exposure limits to ammonium perchlorate. A Quality Assurance review was performed to ensure compliance with Good Laboratory Practices (GLP) regulations.

On July 23 2000, NHRC/TD was selected by the National Research Council Associateship Program as a host site for visiting scientists.

On July 23 2000, the Tri-Service Toxicology Consortium, in collaboration with Wright State University and the Department of Veterans Affairs, was recently awarded a \$5.8M grant to study low level effects of chemical warfare agents.

On August 22 2000, the following proposals were submitted in response to Program Announcement DHRP-00:

1. Defining the Neurobehavioral Consequences of Virtual Retinal Display Technology.
2. Evaluation of the Pulmonary Health Hazards Associated with Combustion of Various Advanced Composite Materials and Relative Toxicity.

CDR John Rossi, LT Cody Wilson, and Dr. Marni Bekkedal traveled to Eglin AFB, FL on 18-22 September 2000 to participate in the eighth and final data collection of the study "Acute Effects of Occupational Exposure to JP-8 Jet Fuel." NHRC/TD is collecting data on changes in the conditioned eyeblink response and examining alterations in gene expression in Air Force jet fuel handlers. This study represents a collaboration between over 15 different federal, state, and private research organizations.

In September 2000, members of the Nellis Air Force Base Civil Engineering Squadron contacted Dr. Robert Carpenter for advice on the inhalation toxicity of burned composite materials following an F-16 crash. Based on the Air Force funded research conducted by Dr. Ed Kimmel the TOXDET was able to outline the potential hazards that these burned materials represent.

In October 2000, Dr. Carpenter and LT Bobb teamed with NSMRL to host the NRC Committee on Toxicology Subcommittee on Disabled Submarine Atmospheric Limits in tour and briefing regarding the relative risks of escape versus exposure on board disabled submarines. In addition to briefings regarding disabled submarine conditions, diving risks associated with ascent from depth, and unusual hazards, the committee visited the USS Dallas for a tour of the submarine and discussions with the crew regarding atmosphere control.

TOXDET personnel initiated the 91-day inhalation JP-8 reproductive Toxicology study in rats on 10 October 2000.

On December 3 2000, Dr. Robert L. Carpenter attended a workshop on Fractals in Biology held by the Santa Fe Institute, 29 Nov - 2 Dec 00. The workshop examined the ability of fractal mathematics to answer questions regarding lung structure, cardiac rhythm, and ecological diversity.

On December 31, 2000, CAPT Still and LT Bobb participated in the SAHAP meeting in Norfolk, VA for which 172 chemical OELs were adopted for submarines.

### 3. Supporting Documents

Scientific and Technical Reports:

#### TECHNICAL REPORTS

1. *Acute Respiratory Toxicity of Advanced Composite Material (ACM) Combustion Atmospheres: B2-ACM*, by E.C. Kimmel, D.L. Courson, J.E. Reboulet, G.S. Whitehead, K.A. Rice, W.K. Alexander, K.A. Phillips, R.L. Carpenter, and K.R. Still was published as Technical Report TOXDET-00-01, DTIC Accession # A374860PAA.
2. *Airway Reactivity Response to Advanced Composite Material (ACM) Combustion Atmospheres: B2-ACM*, by E.C. Kimmel, J.E. Reboulet, D.L. Courson, G.S. Whitehead, K.R. Still, W.K. Alexander, and R.L. Carpenter was published as Technical Report TOXDET-00-02, DTIC Accession # A380781PAA.
3. *A Neurodevelopmental Study of Oral Ammonium Perchlorate Exposure on the Motor Activity of Pre-Weanling Rat Pups*, by M.Y.V. Bekkedal, T. Carpenter, J. Smith, C. Ademujohn, D. Maken, and D. Mattie was published as Technical Report TOXDET-00-03, DTIC Accession # A379703PAA.
4. *Estimation of Aluminum Contributions of U.S. Navy Flight Training Operations in the Chesapeake Bay*, by C.L. Wilson, A. Miladi, and W.K. Alexander was published as Technical Report TOXDET-00-04, DTIC Accession # A386454PAA.
5. *Derivation of Toxicology and Risk Assessment Values for Ambient Air Toxics Detected at Naval Air Facility, Atsugi, Japan*, by C.L. Wilson, K.R. Still, W.E. Luttrell, G. Winecoff, and J. Bowen was published as Technical Report TOXDET-00-05, DTIC Accession # A386482PAA.

## Biography of the Officer in Charge

**Kenneth R. Still, Ph.D.**  
**Captain, Medical Service Corps, U.S. Navy**  
**Officer-in-Charge**  
**Naval Health Research Center Detachment**  
**(Toxicology),**  
**Wright-Patterson Air Force Base, OH**



Captain Kenneth R. Still, Medical Service Corps, U.S. Navy, born in St. Joe, Arkansas, received his baccalaureate degree in Biology from Portland State University, Portland, Oregon in 1970. In 1972, he received his Master of Science degree in Physiological/Chemical Ecology from the same University. He subsequently earned a Doctorate in Physiological/Chemical Ecology from Oklahoma State University in 1976. In 1989, he received a Masters in Business Administration with emphasis in Financial Management and Labor Relations from Chaminade University of Honolulu, Hawaii.

Captain Still was commissioned a Lieutenant Junior Grade, Medical Service Corps, U.S. Navy Reserve, in 1977 and entered active duty on January 3, 1978. From January 1978 until November 1981, he served as Afloat and Staff Industrial Hygienist, Naval Hospital Bremerton, Washington. During the period of November 1981 through October 1984, he was assigned to the Navy Environmental Health Center, Norfolk, Virginia as Special Assistant to the Commanding Officer for Industrial Hygiene and as Head, Occupational Health Planning and Analysis Department and Occupational Toxicology Department. During this tour Captain Still developed, implemented and taught the Navy's Workplace Monitor Training Program. He next served as Head, Occupational Health Branch, Naval Medical Command (Bureau of Medicine and Surgery), Washington, DC from October 1984 until June 1987. Following this, while attached to Navy Environmental Preventive Medicine Unit Number 6, Captain Still was assigned as Deputy Director, Occupational Safety and Health Programs at Naval Logistics Pacific Command, in Pearl Harbor, Hawaii from June 1987 through June 1989. From July 1989 through October 1990, Captain Still served as Director, Occupational Safety and Health Programs at Commander in Chief, U.S. Pacific Fleet headquarters, Pearl Harbor, Hawaii. From November 1990 through November 1994, he served as Director, Naval Inspector General Oversight Inspection Unit, for Occupational Safety, Health and Environmental Program Compliance in Norfolk, Virginia. During this tour Captain Still directed the Navy Occupational Safety and Health Inspection Program and the Navy Environmental Inspection Team. On 9 December, 1994 Captain Still assumed Command as the Officer-in-Charge, Naval Medical Research Institute Toxicology Detachment, WPAFB, OH. On 01 October 1998 Captain Still became the Officer-In-Charge of the Naval Health Research Center Detachment (Toxicology).

Captain Still is a member of the Defense Department's Acquisition Professional Community and is acquisition qualified in Management. He is a recipient of Vice President Gore's Hammer Award for Reinventing Government and holds Adjunct Professorship in Preventive Medicine/Biometrics at the Uniform Services University of Health Sciences, where he teaches Toxicology and Industrial Hygiene.

Captain Still is a professional member of the American Academy of Industrial Hygiene, the American Industrial Hygiene Association, Society of Toxicology, American College of Toxicology, Association of Government Toxicologists, American Society of Safety Engineers, American Conference of Governmental Industrial Hygienists, Navy Industrial Hygiene Association, Sigma Xi, Society of Risk Analysis, International Occupational Hygiene Association, Academy of Hazardous Materials Management, National Registry of Environmental Professionals, and the Naval Institute. He holds quintuple Board Certifications in the fields of Industrial Hygiene, Occupational Safety, Hazardous Materials Management, Environmental Management, and Environmental Auditing. Captain Still is a Registered Environmental Manager, Certified Environmental Auditor, Registered Environmental Property Assessor, and, Registered Environmental Professional under the National Registry of Environmental Professionals, and is Board Eligible for the American Board of Toxicology. Captain Still has over 155 publications in the fields of Industrial Hygiene, Toxicology, Physiology, Ecology, Human Health Risk Assessment and Environmental Risk Assessment.

Enclosure (1)



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